FIBER AMPLIFIER HAVING AN ANISOTROPIC NUMERICAL APERTURE FOR EFFICIENT COUPLING OF PUMP ENERGY

ABSTRACT OF THE DISCLOSURE

An optical fiber amplifier has an anisotropic numerical aperture to optimally couple pump energy into the pump core of a dual-clad fiber. The optical fiber consists of a dual-clad fiber having a longitudinally extending inner core, an outer core surrounding the inner core, and a cladding layer at least partially surrounding the outer core. The outer core is capable of transmitting pump energy to thereby amplify signals propagating through the inner core. Further, the outer core is capable of accepting pump energy within a first range of acceptance angles in a first direction and within a second range of acceptance angles in a second direction that is perpendicular to the first direction. The outer core and the cladding layer are structured such that a numerical aperture of the fiber amplifier in the first direction is different than the numerical aperture of the fiber amplifier in the second direction.

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